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10/709,889	06/03/2004	Manabu Hashikura	039.0043	3888

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EXAMINER

NGUYEN, DAO H

ART UNIT PAPER NUMBER

2818

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05/11/2007

PAPER

* Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/709,889

Applicant(s)

HASHIKURA ET AL.

Examiner

Dao H. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. In response to the communications dated 03/20/2007, claims 1-19 are active in this application.

Remarks

2. Applicant's argument(s), filed 03/20/2007, with respect to claims 1-19 have been fully considered, but are not persuasive. Particularly, Examiner do/does not agree with Applicants' argument(s) that none of the cited references teach or suggest the claimed limitations.

First, with regard to the teaching of Wang et al. (US 6,490,146), figure 1 shows a ceramic susceptor 190 (col. 11, lines 1-29) and a composite of a ceramic and a metal 175 (col. 5, line 40 to col. 6, line 38), wherein the ceramic-metal composite 175 is furnished **atop** the ceramic susceptor 190. The ceramic-metal composite 175 is clearly not deployed within the ceramic susceptor 190. Applicants are noted that argument(s) not relating to the claimed subject matter would not have any patentable weight.

Second, with regard to the teaching of Ohashi et al. (US 2003/0064225), fig. 12, for example, shows ceramic susceptor 120/127 (see the abstract) and a composite of a ceramic and a metal 125 (para. [0109]), wherein the ceramic-metal composite 125 is furnished **atop** the ceramic susceptor 120/127. Again, Applicants are reminded that

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argument(s) not relating to the claimed subject matter would not have any patentable weight.

Third, with regard to the teaching of Inazumachi et al. (US 6,693,789), figs. 1, 2, show ceramic susceptor 3 (col. 6, lines 33-40) and a composite of a ceramic and a metal 2, wherein the ceramic-metal composite 2 is clearly furnished **atop** the ceramic susceptor 3. Again, Applicants are reminded that argument(s) not relating to the claimed subject matter would not have any patentable weight.

For the above reasons, it is believed that the previous Office Action should be retained, and rewritten below.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claim(s) 1, 11, 15, and 19 are rejected under 35 U. S. C. § 102 (b) as being anticipated by U.S. Patent No. 6,490,146 to Wang et al.**

Regarding claim 1, Wang discloses a holder for use in semiconductor or liquid-crystal manufacturing devices, comprising:

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a ceramic susceptor 190 (fig. 1; col. 11, lines 1-29); and
a composite 175 of a ceramic and a metal furnished atop said ceramic susceptor 190, the composite 175 including a mixture of metallic and ceramic constituents, the mixture including metallic microconstituents distributed in a ceramic matrix. See also col. 5, line 40 to col. 6, line 38.

Regarding claim 11, Wang discloses a holder for use in semiconductor or liquid crystal manufacturing devices, the holder comprising:

a processing surface 115 (on which substrate 30 being placed) configured to hold the semiconductor or liquid crystal manufacturing device;

a ceramic susceptor 190 (fig. 1, col. 11, lines 1-29); and
ceramic-metal composite 175 deployed between the processing surface and the ceramic susceptor 190, the ceramic-metal composite 175 including a substantially uniform mixture of ceramic and metal microconstituents. See also col. 5, line 40 to col. 6, line 38.

Regarding claims 15 and 19, Wang discloses a holder wherein the composite comprises metal infiltrated into a porous ceramic substrate. See col. 5, lines 59-64.

5. Claim(s) 1-19 are rejected under 35 U. S. C. § 102 (b) as being anticipated by U.S. Patent Application Publication No. 2003/0064225 by Ohashi et al.

Regarding claim 1, Ohashi discloses a holder for use in semiconductor or liquid-crystal manufacturing devices (para. 0026)), comprising:

a ceramic susceptor 120 or 127 (fig. 12); and

a composite 125 of a ceramic and a metal furnished atop said ceramic susceptor 120/127, the composite 125 including a mixture of metallic and ceramic constituents, the mixture including metallic microconstituents distributed in a ceramic matrix. See paras. [0081], [0090], [0109].

Regarding claim 2, Ohashi discloses a holder wherein the Young's modulus of the ceramic-and-metal composite is 300 GPa or less. See para. [0034].

Regarding claim 3, Ohashi discloses a holder wherein the thermal conductivity of the ceramic-and-metal composite is 100 W/mK or more. See paras. [0034], [0048], [0065], [0078].

Regarding claim 4, Ohashi discloses a holder wherein the thermal expansion coefficient of the ceramic-and-metal composite is 2.5×10^{-6} to $8.0 \times 10^{-6}/^{\circ}\text{C}$. See paras. [0034], [0048], [0065], [0078].

Regarding claim 5, Ohashi discloses a holder further comprising a support part 56 (fig. 8) or 112 (fig. 12) supporting the ceramic-and-metal composite.

Regarding claim 6, Ohashi discloses a holder further comprising a support part 56 (fig. 8) or 112 (fig. 12) supporting the ceramic susceptor.

Regarding claim 7, Ohashi discloses a holder further comprising a support part 56 (fig. 8) or 112 (fig. 12) supporting both the ceramic-and-metal composite and the ceramic susceptor.

Regarding claim 8, Ohashi discloses a holder wherein a coating 58 (fig. 8) or 128 (fig. 12) is formed on at least a processed-object-retaining side of the holder.

Regarding claim 9, Ohashi discloses a holder wherein the ceramic-and-metal composite 125 functions as an electrode. See para. [0109].

Regarding claim 10, Ohashi discloses a semiconductor or liquid-crystal manufacturing device in which the holder of claim 1 is installed. See paras. [0026], [0090].

Regarding claim 11, Ohashi discloses a holder for use in semiconductor or liquid crystal manufacturing devices, the holder comprising:

- a processing surface configured to hold the semiconductor or liquid crystal manufacturing device (surface of layer 128 on which silicon wafer W being mounted; see fig. 12 and paras. [0043], [0077]);

- a ceramic susceptor 120 or 127; and

ceramic-metal composite 125 deployed between the processing surface and the ceramic susceptor 120/127, the ceramic-metal composite 125 including a substantially uniform mixture of ceramic and metal microconstituents. See paras. [0081], [0090], [0109].

Regarding claim 12, Ohashi discloses a holder wherein the processing surface is a surface of the ceramic-metal composite. See fig. 12.

Regarding claim 13, Ohashi discloses a holder wherein the ceramic susceptor comprises a resistive element 45 (fig. 7b) or 75 (fig. 10) deployed in or on a surface of a ceramic substrate. See also paras. [0060], [0104], [0108].

Regarding claim 14, Ohashi discloses a holder wherein the ceramic-metal composite comprises a sintered mixture of metal and ceramic powders. See paras. [0081], [0090], [0109].

Regarding claim 15, Ohashi discloses a holder wherein the ceramic-metal composite comprises metal infiltrated into a porous ceramic substrate. See paras. [0081], [0090], [0109], [0114], [0118].

Regarding claim 16, Ohashi discloses a holder wherein the metal comprises at least one member of the group consisting of Al, Si, and Cu; and the ceramic comprises

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at least one member of the group consisting of SiC, Al₂O₃, AlN, WC, and BN. See paras. [0033-0034], [0060], [0081], [0090], [0109].

Regarding claim 17, Ohashi discloses a holder wherein the ceramic-metal composite comprises at least one compound selected from the group consisting of Al-SiC, Al-Al₂O₃, Al-AlN, Si-SiC, Si-Al₂O₃, and Si-AlN. See paras. [0033-0034], [0060], [0081], [0090], [0109].

Regarding claim 18, Ohashi discloses a holder wherein the composite comprises a sintered mixture of metal and ceramic powders. See paras. [0081], [0090], [0109].

Regarding claim 19, Ohashi discloses a holder wherein the composite comprises metal infiltrated into a porous ceramic substrate. See paras. [0081], [0090], [0109], [0114], [0118].

6. Claim(s) 1-4, 8-11, and 14-19 are rejected under 35 U. S. C. § 102 (b) as being anticipated by U.S. Patent No. 6,693,789 to Inazumachi et al.

Regarding claim 1, Inazumachi discloses a holder for use in semiconductor or liquid-crystal manufacturing devices (col. 1, lines 15-26), comprising:

a ceramic susceptor 3 (col. 6, lines 23-40; figs. 1-2); and

a composite of a ceramic and a metal 2 furnished atop said ceramic susceptor 3, the composite 2 including a mixture of metallic and ceramic constituents, the mixture

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including metallic microconstituents distributed in a ceramic matrix. See col. 5, lines 51-63; col. 7, lines 1-28; col. 9, lines 45-63.

Regarding claim 2, Inazumachi disclose a holder wherein the Young's modulus of the ceramic-and-metal composite is 300 GPa or less. See col. 5, lines 51-63; col. 7, lines 1-28; col. 9, lines 45-63.

Regarding claim 3, Inazumachi discloses a holder wherein the thermal conductivity of the ceramic-and-metal composite is 100 W/mK or more. See col. 5, lines 51-63; col. 7, lines 1-28; col. 9, lines 45-63.

Regarding claim 4, Inazumachi discloses a holder wherein the thermal expansion coefficient of the ceramic-and-metal composite is 2.5×10^{-6} to $8.0 \times 10^{-6}/^{\circ}\text{C}$. See col. 5, lines 51-63; col. 7, lines 1-28; col. 9, lines 45-63.

Regarding claim 8, Inazumachi discloses a holder wherein a coating 11 is formed on at least a processed-object-retaining side of the holder. See figs. 1-2.

Regarding claim 9, Inazumachi discloses a holder wherein the ceramic-and-metal composite functions as an electrode. See col. 7, lines 1-9.

Regarding claim 10, Inazumachi discloses a semiconductor or liquid-crystal manufacturing device in which the holder of claim 1 is installed. See col. 1, lines 15-26.

Regarding claim 11, Inazumachi discloses a holder for use in semiconductor or liquid crystal manufacturing devices, the holder comprising:

a processing surface (on which plate sample being placed; col. 6, lines 23-28) configured to hold the semiconductor or liquid crystal manufacturing device (col. 1, lines 15-26);

a ceramic susceptor 3 (figs. 1-2); and

a ceramic-metal composite 2 deployed between the processing surface and the ceramic susceptor 3, the ceramic-metal composite 2 including a substantially uniform mixture of ceramic and metal microconstituents. See col. 5, lines 51-63; col. 7, lines 1-28; col. 9, lines 45-63; col. 11, lines 46-67.

Regarding claim 14, Inazumachi discloses a holder wherein the ceramic-metal composite comprises a sintered mixture of metal and ceramic powders. See col. 5, lines 51-63; col. 7, lines 1-28; col. 9, lines 45-63; col. 11, lines 46-67.

Regarding claim 15, Inazumachi discloses a holder wherein the ceramic-metal composite comprises metal infiltrated into a porous ceramic substrate. See col. 5, lines 51-63; col. 7, lines 1-28; col. 9, lines 45-63; col. 11, lines 46-67.

Regarding claim 16, Inazumachi discloses a holder wherein the metal comprises at least one member of the group consisting of Al, Si, and Cu; and the ceramic

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comprises at least one member of the group consisting of SiC, Al₂O₃, AlN, WC, and BN.

See col. 5, lines 51-63; col. 7, lines 10-28.

Regarding claim 17, Inazumachi discloses a holder wherein the ceramic-metal composite comprises at least one compound selected from the group consisting of Al-SiC, Al-Al₂O₃, Al-AlN, Si-SiC, Si-Al₂O₃, and Si-AlN. See col. 5, lines 51-63; col. 7, lines 10-28.

Regarding claim 18, Inazumachi discloses a holder wherein the composite comprises a sintered mixture of metal and ceramic powders. See col. 5, lines 51-63; col. 7, lines 1-28; col. 9, lines 45-63; col. 11, lines 46-67.

Regarding claim 19, Inazumachi discloses a holder wherein the composite comprises metal infiltrated into a porous ceramic substrate. See col. 5, lines 51-63; col. 7, lines 1-28; col. 9, lines 45-63; col. 11, lines 46-67.

Conclusion

7. **THIS ACTION IS MADE FINAL.** A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH

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shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dao Nguyen whose telephone number is (571)272-1791. The examiner can normally be reached on Monday-Friday 9:00am - 6:00pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571)272-1907. The fax numbers for all communication(s) is (571)273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.



Dao H. Nguyen
Art Unit 2818
May 3, 2007



Andy Huyen
Primary Examiner